

### **Remarks**

This is in response to the non-final Office Action mailed on March 9, 2004. Claims 1, 2, 7, 8, 13, 14, and 17-20 are editorially amended, and claims 1-20 remain pending. Reconsideration and allowance are respectfully requested in view of the following remarks.

#### **I. Preliminary Remark Regarding Claim Amendments**

Claims 1, 2, 7, 8, 13, 14, and 17-20 are amended to address informalities. None of these amendments to the claims is meant to limit the scope of the claims in any manner.

#### **II. Claim Objections**

Claim 7 is objected to because of an informality. Claim 7 is amended to address the informality. Reconsideration and removal of the objection are respectfully requested.

#### **III. Claim Rejections - 35 U.S.C. § 103**

Claims 1-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Moudgill, U.S. Patent No. 6,578,094, in view of Nishikawa, U.S. Patent No. 6,346,822. This rejection is respectfully traversed, and reconsideration is requested in view of the following remarks.

Claim 1 is directed to a method for preventing overrun of an input data buffer within a program having the input data buffer on a stack data structure. Claim 1 recites, among other limitations, the following:

- pushing all arguments to a function onto the stack data structure;
- pushing onto the stack data structure a security token, the security token comprising a randomly generated data value;
- retrieving the security token value from the stack data structure; and
- if the retrieved security token value is identical to the randomly generated data value, returning from the function using the return address stored on the stack data structure.

Alteration of the security token value can indicate that the stack no longer contains data that may be trusted. In this manner, when alteration of the security token value is detected, execution can be aborted and the system stack reinitialized to ensure the integrity of the data on the stack.

Moudgill discloses a method for preventing buffer overflow attacks. Moudgill discloses a "bound checking" procedure that calculates and returns the "safe" upper bound value to prevent overwriting due to overflow. Moudgill, col. 5, l. 65 - col. 6, l. 15.

The rejection concedes that Moudgill fails to disclose or suggest pushing a security token onto the stack data structure, the security token comprising a randomly generated data value, as recited by claim 1. The rejection cites Nishikawa for disclosing a security token. This characterization of Nishikawa is respectfully traversed for at least the following reasons.

Nishikawa discloses a semiconductor integrated circuit having a diagnosis function. Specifically, Nishikawa discloses two shift registers which store randomly-generated numbers and a comparator that compares the numbers stored in the shift registers to diagnose an operating state of the integrated circuit. Nishikawa, col. 3, l. 43 - col. 4, l. 3.

One skilled in the art would not be motivated to combine the method for preventing buffer overflow disclosed by Moudgill with the integrated circuit diagnosis function disclosed by Nishikawa for at least the following reasons.

Nishikawa discloses a diagnosis function for an integrated circuit and fails to disclose or suggest that it would be desirable to use randomly-generated numbers to prevent overflow in a method such as that disclosed by Moudgill. Therefore, there is no motivation to combine Nishikawa with Moudgill.

Further, Moudgill teaches away from inserting a security token into the stack as recited by claim 1. For example, Moudgill teaches away from prior art overflow prevention systems that insert data (e.g., a "canary" word) in a stack to detect overflow conditions:

Yet another approach is one in which the compiler puts a "canary" word just before the procedure return pointer on the stack. A canary word is simply a word containing a special pattern. Prior to returning from a routine, the code determines if the word has been overwritten. If so, it is determined that there has been a buffer overrun. Apart from requiring recompilation, this technique also suffers from the problem that it can be defeated by, e.g., guessing the canary word.

Moudgill, col. 4, ll. 19-27. Therefore, one skilled in the art would not be motivated to modify the method disclosed by Moudgill to insert a security token, as recited by claim 1, because Moudgill teaches away from such a configuration.

Reconsideration and allowance of claim 1, as well as claims 2-6 that depend therefrom, are respectfully requested for at least these reasons.

Claim 7 recites an apparatus for preventing overrun of an input data buffer. Claim 7 recites, among other limitations, a push security token module placing onto the stack data structure a security token, the security token comprising a randomly generated data value, and a test module comparing the retrieved security token with the randomly generated data value. Therefore, claim 7, as well as and claims 8-12 that depend therefrom, is allowable for at least reasons similar to those provide above with respect to claim 1. Reconsideration and allowance are requested.

Claim 13 is directed to a computer program product readable by a computing system and encoding a set of computer instructions implementing a method for preventing overrun of an input data buffer. Claim 13 recites, among other limitations, pushing onto the stack data structure a security token, the security token comprising a randomly generated data value, and retrieving the security token value from the stack data structure. Therefore, claim 13, as well as claims 14-19 that depend therefrom, is allowable for at least reasons similar to those provide above with respect to claim 1. Reconsideration and allowance are requested.

Claims 20 is rejected under section 103(a) as being unpatentable over Moudgill and Nishikawa in view of Williams, U.S. Patent No. 6,519,702. This rejection is respectfully traversed, and the correctness of the rejection is not conceded.

However, claim 20 depends from claim 13. Williams does not remedy the shortcomings of Moudgill and Nishikawa noted above. Therefore, claim 20 is allowable for at least the same reasons as those provided above with respect to claim 13. Reconsideration and allowance are respectfully requested.

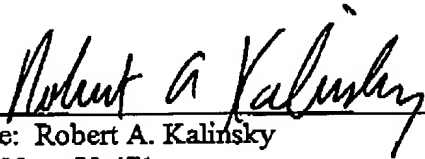
#### IV. Conclusion

The remarks set forth above provide certain arguments in support of the patentability of the pending claims. There may be other reasons that the pending claims are patentably distinct over the cited references, and the right to raise any such other reasons or arguments in the future is expressly reserved.

Favorable reconsideration in the form of a Notice of Allowance is respectfully requested.  
The Examiner is encouraged to contact the undersigned attorney with any questions regarding  
this application.

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